

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A fuel injection device, comprising:
a valve body having an injection hole and a valve seat formed on an inner peripheral surface thereof on a fuel inlet side of the injection hole;
a valve member including a contacting portion forming a sealing portion together with the valve seat and a movable core disposed at an end of the valve member opposite from the contacting portion, wherein fuel injection from the injection hole is allowed if the contacting portion separates from the valve seat and the fuel injection is stopped if the contacting portion is seated on the valve seat; and
guiding means for guiding the valve member so that the valve member can reciprocate in an axial direction of the fuel injection device, wherein the guiding means is formed with an inner surface of the valve body and an outer surface of the valve member, which slides in contact with the inner surface of the valve body, wherein
the fuel injection device is formed so that arbitrary virtual perpendicular lines, which cross the sealing portion and are perpendicular to the inner peripheral surface of the valve body providing the valve seat, intersect with each other at an intersecting point, which is positioned between a first end of the guiding means on a sealing portion side and a second end of the guiding means opposite from the sealing portion, and a distance in the axial direction between the sealing portion and an end of the movable core opposite from the sealing portion is equal to or less than 18 millimeters.

2. (Original) The fuel injection device as in claim 1, wherein the guiding means is formed continuously along an inner periphery of the valve body.

3. (Original) The fuel injection device as in claim 1, wherein the valve member is formed in the shape of a cylinder, in which a fuel passage is formed.

4. (Currently amended) The fuel injection device as in claim 1, further comprising:

electromagnetic driving means ~~having~~ including a coil, the movable core, ~~a movable core disposed on an end of the valve member opposite from the contacting portion~~, and a fixed core, wherein magnetic attraction is generated between the movable core and the fixed core if the coil is energized.

5. (Original) The fuel injection device as in claim 4, wherein the fuel injection device is formed so that a distance in the axial direction between the intersecting point and the second end of the guiding means opposite from the sealing portion is equal to or less than one tenth of a distance in the axial direction between the sealing portion and an end of the movable core opposite from the sealing portion.

Claim 6. (Canceled).

7. (Original) The fuel injection device as in claim 4, further comprising:
a holder having an inner surface, with which an outer surface of the movable core can slide in contact.

8. (Original) The fuel injection device as in claim 1, wherein the fuel injection device is formed so that a distance in the axial direction between the sealing portion and the intersecting point is calculated from a following equation:

$$M = D/2 \times \cot(\theta/2),$$

where M represents the distance in the axial direction between the sealing portion and the intersecting point, D is a diameter of the sealing portion and θ is an angle provided by the two virtual perpendicular lines respectively extending from two

points on the sealing portion, the two points being distant from each other the most on the sealing portion.

9. (Original) The fuel injection device as in claim 1, wherein the valve member is formed in the shape of a cylinder and the inner peripheral surface of the valve body providing the valve seat is inclined with respect to the axis of the fuel injection device so that an opening area provided by the inner peripheral surface increases toward the valve member.

10. (New) A fuel injection device, comprising:

a valve body having an injection hole and a valve seat formed on an inner peripheral surface thereof on a fuel inlet side of the injection hole;

a valve member including a contacting portion forming a sealing portion together with the valve seat, wherein fuel injection from the injection hole is allowed if the contacting portion separates from the valve seat and the fuel injection is stopped if the contacting portion is seated on the valve seat; and

guiding means for guiding the valve member so that the valve member can reciprocate in an axial direction of the fuel injection device, wherein the guiding means is formed with an inner surface of the valve body and an outer surface of the valve member, which slides in contact with the inner surface of the valve body, wherein

the fuel injection device is formed so that arbitrary virtual perpendicular lines, which cross the sealing portion and are perpendicular to the inner peripheral surface of the valve body providing the valve seat, intersect with each other at an intersecting point, which is positioned between a first end of the guiding means on a sealing portion side and a second end of the guiding means remote from the sealing portion, and

a distance in the axial direction between the intersecting point and the second end of the guiding means is equal to or less than 1.8 millimeters.

11. (New) The fuel injection device as in claim 10, wherein the guiding means is formed continuously along an inner periphery of the valve body.

12. (New) The fuel injection device as in claim 10, wherein the valve member is formed in the shape of a cylinder, in which a fuel passage is formed.

13. (New) The fuel injection device as in claim 10, further comprising:
electromagnetic driving means including a coil, a movable core disposed on an end of the valve member remote from the contacting portion, and a fixed core, wherein magnetic attraction is generated between the movable core and the fixed core if the coil is energized.

14. (New) The fuel injection device as in claim 13, wherein the fuel injection device is formed so that said distance in the axial direction between the intersecting point and the second end of the guiding means is equal to or less than one tenth of a distance in the axial direction between the sealing portion and an end of the movable core remote from the sealing portion.

15. (New) The fuel injection device as in claim 14, wherein the fuel injection device is formed so that the distance in the axial direction between the sealing portion and the end of the movable core remote from the sealing portion is equal to or less than 18 millimeters.

16. (New) The fuel injection device as in claim 13, further comprising:
a holder having an inner surface, with which an outer surface of the movable core can slide in contact.

17. (New) The fuel injection device as in claim 10, wherein the fuel injection device is formed so that a distance in the axial direction between the sealing portion and the intersecting point is calculated from a following equation:

$$M = D/2 \times \cot(\theta/2),$$

where M represents the distance in the axial direction between the sealing portion and the intersecting point, D is a diameter of the sealing portion and θ is an angle provided by the two virtual perpendicular lines respectively extending from two points on the sealing portion, the two points being distant from each other the most on the sealing portion.

18. (New) The fuel injection device as in claim 10, wherein the valve member is formed in the shape of a cylinder and the inner peripheral surface of the valve body providing the valve seat is inclined with respect to the axis of the fuel injection device so that an opening area provided by the inner peripheral surface increases toward the valve member.